DOCUMENT RESUME

ED 320 561 IR 014 477

AUTHOR Hoelscher, Karen J.
TITLE Bridging the Classroom and the Real World: A Videodisc Implementation Study at Harvard Law School.
PUB DATE Apr 90
NOTE 51p.; Paper presented at the Annual Meeting of the American Educational Research Association (Boston, MA, April 16-20, 1990). Tables (p.44-51) contain small blurred type.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Computer Assisted Instruction; *Computer Simulation; Formative Evaluation; Higher Education; *Interactive Video; Intermode Differences; Interviews; *Legal Education (Professions); Observation; Questionnaires
IDENTIFIERS *Orienting Instruction

ABSTRACT

This study examined how first-year law students developed a civil rights case using an open-ended interactive videodisk ("Litigation Strategies"), which uses a visual and textual database to complement the traditional curriculum by simulating the experience of a junior partner in a law firm. An implementation and formative evaluation examined the use of two types of orienting instruction: (1) unguided (i.e., general instructions and a statement of the task); and (2) guided (i.e., instructions, task statement, and a list of case development strategies). Twenty pairs of second-semester Harvard Law students volunteered to participate. Student pairs were randomly assigned to guided or unguided orienting instruction to develop the case. After 90 minutes, they specified three criteria for a legal complaint: plaintiff(s), defendant(s) and cause(s) of action. Data collection involved direct observation, online tracking of usage patterns, post-use completion of the legal complaint, an individual post-use questionnaire, and a post-use structured interview. Data analyses addressed students' pathways through the case, the relationship between mode of use and performance on the complaint, and the relationship between mode of use and student perceptions of their experience. Results indicate that while both guided and unguided student pairs used a variety of effective case development strategies, guided pairs were more likely to produce superior legal complaints than unguided pairs. Additional orienting instruction was desired by 70% of the unguided pairs as well as by 40% of the guided pairs. (25 references) (GL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED320561

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Bridging the Classroom and the Real World: A Videodisc Implementation Study at Harvard Law School

Karen J. Hoelscher, Multimedia Research
1016 Island Lake Avenue
St. Paul, MN 55126
(612) 481-1630

Presented at the Annual Meeting of the
American Educational Research Association
Boston, Massachusetts
April, 1990

IR014477

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Karen J. Hoelscher

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

BEST COPY AVAILABLE

Bridging the Classroom and the Real World:
A Videodisc Implementation Study at Harvard Law School

Abstract

This study examined how first-year law students used an open-ended interactive videodisc to develop a civil rights case. The *Litigation Strategies* videodisc uses a visual and textual database to complement traditional curriculum by simulating the experience of a junior partner in a law firm. Using a set of desktop tools (e.g., a telephone to contact the client and 28 witnesses involved in the case; an intercom to communicate with the senior partner, investigative assistant, and legal assistant; and a file system to review and revise documents relating to the case), students gain practical experience in establishing an attorney/client relationship, interviewing witnesses, evaluating evidence, and interpreting legal documents.

An implementation formative evaluation examined the use of two types of orienting instruction provided students using *Litigation Strategies*: unguided (i.e., general instructions and a statement of the task), and guided (i.e., instructions, task statement, and a list of case development strategies). Twenty pairs of second-semester Harvard Law students, all from the same Legal Methods course, volunteered to participate in the study. Student pairs were randomly assigned to guided or unguided orienting instruction to develop the case. After 90 minutes, they specified three criteria for a legal complaint: plaintiff(s), defendants(s), and cause(s) of action.

Data collection involved: a) direct observation, b) online tracking of usage patterns, c) post-use completion of the legal complaint, d) an individual post-use questionnaire, and e) a paired post-use structured interview. Data analysis addressed: a) students' pathways through the case, b) the relationship between mode of use and performance on the complaint, and c) the relationship between mode of use and student perceptions of their experience.

Results included:

1) Guided and unguided student pairs used a variety of effective case development strategies, with unguided pairs intuiting many of the suggestions developed for the guided orienting instruction.

2) Guided student pairs were more likely to produce superior legal complaints than unguided pairs, and guided pairs with no prior legal experience before law school were more likely to produce superior complaints than unguided inexperienced pairs.

3) Additional orienting instruction was desired by 70% of unguided pairs as well as by 40% of guided pairs in this study; 10% of guided pairs desired less orienting instruction.

The goal of this study was to further our knowledge of the use of videodisc simulations for learning by documenting two modes of use, and by documenting the resulting student performance and self-perceptions. These results underscore the importance of learning more about developing orienting instruction in cognitively-demanding environments.

Dr. Karen J. Hoelscher
Multimedia Research
1016 Island Lake Avenue
St. Paul, MN 55126
(612) 481-1630

INTRODUCTION

In the past decade, educational researchers have studied the learning benefits of computer technology, expecting to provide evidence of advantages over traditional instruction. There currently exists little proof that computers influence student achievement more than previous educational innovations (Becker, 1987; Clark, 1985; Roblyer, 1985), especially when they are used to replace traditional methods of teaching. There exists considerable proof of the benefit of computer-based instruction designed to simulate experience beyond textbook and lecture learning (Bok, 1985; Roblyer, Castine, & King, 1988; Zollman, Noble, & Curtin, 1987). For example, computer-based simulations allow medical students to develop diagnostic skills before meeting a real patient; simulations allow engineering students to conduct stress-testing on computerized model bridges before designing the structural plans for an actual bridge; they can enable future NASA scientists to employ rocket-launching techniques. Thus, the computer environment provides simulated career experiences that enhance the traditional classroom environment.

Law schools are beginning to use computer-based technology to teach process-oriented skills such as establishing client-attorney relationships, interviewing witnesses, and evaluating evidence. These skills are difficult to learn merely through reading cases or listening to another's experience. Based on these needs, a complex interactive videodisc program called *Litigation Strategies* was created to provide practical case development experience within the legal education curriculum. Because the experience is cognitively-demanding, orienting instructions were developed to bridge students' prior classroom knowledge and their simulated case development experience. This study was designed to examine the use of the program by first year Harvard Law School students.[1]

Design of the Videodisc

Litigation Strategies simulates the experience of a junior partner in a law firm who is assigned to investigate an actual civil rights case. The case is introduced by a referral memo from the senior

---

[1] This study was conducted while the author was a doctoral candidate at the Harvard University Graduate School of Education. Funding for the study was provided by the Harvard University Assessment Seminar, with support from the American Video Institute, Harvard Law School, and Lawyers' Cooperative Press.

partner in the firm. The videodisc shows a view of a lawyer's desktop. On the desk are tools students can use to prepare the case: a legal pad (instructions and calculation of costs), a set of file folders (documents relating to the case), and an address file and telephone (communication with witnesses). An intercom connects students with the senior partner, an investigative assistant, and a legal assistant, each of whom can assist in preparing the case. Using these tools, students have access to a visual and textual database of information about the case that can be used in any order. After meeting the client, interviewing any of 28 other people involved with the case, examining evidence, and conducting legal research, the junior partner files a complaint in court, specifying such criteria as plaintiff, defendant, and causes of action.

As the case is prepared, the program monitors students' strategies and tallies the resulting costs to the firm. To increase the realism, students face various tactical and ethical decisions (e.g., unannounced visits from the town attorney who proposes an out-of-court settlement, and from a newspaper reporter who wants early information about the case). As in real life, actions have direct consequences, and failure is a real possibility. However, the disc is designed to promote learning by experience with a hypothetical case, versus learning at the expense of a real client. Upon filing the complaint, students receive a printed assessment of the methods they have used in preparing the case. This report evaluates student performance using current legal standards.

The development of *Litigation Strategies* was a collaboration among several groups of people with expertise in legal education and technology evaluation:

- Design and development by the American Video Institute at the Rochester Institute of Technology, the Harvard Law School Interactive Video Project, and Lawyers' Cooperative Press
- Content assistance by second and third-year students at Harvard Law School
- Evaluation participation by first-year students at Harvard Law School
- Evaluation support by the Harvard University Assessment Seminar, a group supporting projects designed to study issues in teaching and learning (with additional evaluation funding from the American Video Institute, Harvard Law School, and Lawyers' Cooperative Press)

Because the instructional design of *Litigation Strategies* uses an open-ended discovery approach to developing a case, the development team wanted to learn more about how students actually use the videodisc. Based on an earlier study with practicing lawyers and law students at varying levels of legal education,[2] this study was designed to investigate the use of orienting instruction to link students' past theoretical knowledge with what they would be expected to do in this cognitively-demanding simulated case development environment. This general question guided the research:

How does orienting instruction affect students' use of the program and their performance on a post-use complaint?

Litigation Strategies was designed to bridge the theory students learn in law school classrooms and the practice they will enter as legal professionals. As the product was being created, the goal of the development team was to build a better bridge by connecting students' previous learning with their use of the videodisc. Three general questions framed an implementation research method to address the experimental, open-ended design of *Litigation Strategies*. These hypotheses were tested:

H1: Students using the guided orienting instruction will choose more effective strategies for case development than students using the unguided orienting instruction.

H2: Students using the guided orienting instruction will specify more complete complaint criteria than students using the unguided orienting instruction.

H3: Student perception of the videodisc environment (e.g., appeal, utility, comfort, control) will vary with respect to the mode of orienting instruction.

The next section describes the methodology used to test the general hypothesis that orienting instruction would affect students' use of -- and subsequent performance within -- the complex computer-based environment.

---

[2] This research was preceded by a pilot study during the development of *Litigation Strategies*. The first study collected data on the use of the videodisc by experienced attorneys and 2nd and 3rd year Harvard Law School students. These data were used to improve the design of the videodisc prior to the study reported here.

METHOD

The instructional design of an educational product determines in part the research methods developed to assess its use by learners. *Litigation Strategies* addresses goals beyond the usual scope of the first-year law school curriculum. Thus, there is no traditional instruction to which this environment can be compared. To examine students' use of this case development environment under specific orienting conditions, an implementation formative evaluation was conducted.

This observational study was conducted over a 3-week period in the spring of 1989 at Harvard Law School, examining the use of two types of orienting instructions -- guided and unguided. Twenty pairs of first year students were randomly placed in either the guided or unguided group, resulting in 10 student pairs in each group. Before beginning the legal case, all student pairs received 3 identical documents: 1) a case referral memo, 2) general instructions about using the technology, and 3) a statement of the task following the investigation (i.e. listing specific information on a complaint to be filed in court). In addition, guided pairs received an orienting checklist that was expected to help students focus on particular parts of the disc. After using the disc for 90 minutes, each pair specified the plaintiff(s), defendant(s), and cause(s) of action and listed anticipated problems in bringing the case to trial. Participants then independently completed a 10-item questionnaire and responded to a brief structured interview with their partner. The entire experience lasted between 2 1/2 and 3 hours.

Measures

In this study, multiple measures collected diverse types of data, permitting greater understanding of learners' experience. Two types of measures were uses: 1) measures of student performance, and 2) measures of student perception. Student performance data were collected with: (a) an online computer program that tracks student pathways, (b) direct observation, and (c) a paper and pencil test (i.e. the complaint form). Student perception data were collected with: (a) a closed and open-response individual questionnaire, and (b) a brief, structured pair interview. Measures in each category will be briefly described here.

1. Measures of Student Performance

Pathway Tracking Program. A data collection device within the *Litigation Strategies* program monitored each use of the disc. This tracking device recorded each pathway (i.e., the series of steps and time elapsed between those steps) used to investigate the case. This pathway was saved and later printed, providing a record of the sequence and duration of choices made during the investigation. For example, a pathway might show that a student pair began their investigation by making these choices:

- Conducted the initial client interview with Donald Boyd (13 minutes);
- Ordered from the Investigative Assistant: the 911 report, 5 witness statements, and a street diagram of the area where the incident took place (1 minute, 15 seconds);
- Read the 911 report, examined the street diagram (7 minutes, 20 seconds);
- Interviewed 2 eyewitnesses to the alleged incident (27 minutes); and
- Ordered 3 legal memos from the Legal Assistant (2 minutes).

This tracking system was useful not only in collecting sequence and duration data but in quickly determining frequency counts within and across given data sets. Many of the advantages of an online data collection device are obvious. This tracking system provides a structured, easy-to-understand report of the sequence and duration of choices each student pair used to investigate the case. It added rigor and ease to the tedious process of narrating, in writing, a student's specific pathway through the investigation. This allowed direct observation in other areas, such as collaboration and conversation between partners, providing a more complete understanding of the thinking of pairs as they strategized out loud.

Direct Observation. Data collected by the tracker program were augmented with direct onlooker observation (i.e., no interaction with participants after the initial introduction and assignment) of each student pair using the disc. Since the sequence and duration of strategies was collected by the tracking program, observations focused on data not collectable by machine. This included the presence or absence of: (a) verbal and non-verbal communication between pairs, and (b) physical

responses to the program (e.g., gesturing, nodding, moving toward or away from the screen). Direct observation of participants in this study provided several advantages: 1) the opportunity to see and hear things the tracker program could not record; 2) the chance to understand, firsthand, the context in which the program was used by an intended audience; and 3) the opportunity to see and hear things the participants may not have been willing to share in an interview or on a questionnaire.

Paper and Pencil Complaint Form. Immediately after investigating the case, students were asked to specify three criteria for filing a complaint in the case: 1) the defendant(s), 2) the plaintiff(s), and 3) the cause(s) of action. This measure was designed to replicate an actual complaint form used in court. Students used a "fill in the blank" style for completing the complaint, choosing from several names of people and possible causes of action in the case. They also provided a short narrative justifying their stated cause(s) of action (as required by Rule 11 of the Federal Rules of Civil Procedure) and described possible problems they anticipated in taking the complaint to court.

2. Measures of Student Perception

Individual Questionnaire. Questionnaire responses provided scale and descriptive data about individual participants' perceptions of using the videodisc environment to investigate a legal case. Questions addressed students' perceptions of the adequacy of the orienting instruction, the adequacy of the level of control they experienced using the program, their understanding of the case, their level of confidence in their complaint criteria, and their perceptions of working with a partner. To determine accurate individual data, participants completed the questionnaire independently before the interview with their partner.

Structured Pair Interview. The interview was structured to gain broader understanding of the experience of each student pair. Interview responses provided descriptive data about the multiple perspectives of the students who used the disc. Questions addressed students perceptions of their ability to apply prior knowledge in the videodisc environment, to gain new knowledge, and their assessment of the relevance of the disc use to the first-year law school curriculum. Perhaps equally important, the structured interview helped uncover and document effects the program developers did

not intend to produce. Results were used to improve the introduction and educational use of videodisc technology.

The measures of performance and perception were designed to relate to one or more of the hypotheses in the study. Table 1 indicates how each measure relates to each hypothesis.

TABLE 1 ABOUT HERE:

RELATIONSHIP BETWEEN MEASURES AND HYPOTHESES

Taken together, these diverse sources of information and data provided a broad picture of participants' use and perceptions of the *Litigation Strategies* program. The use of multiple measures to collect various kinds of information allowed cross-validation of information from each. In the next section of this paper, data from the study are presented.

RESULTS

This study was designed to determine the impact of orienting instruction on three outcomes: 1) law students' case development strategies in a videodisc environment; 2) their performance on a written legal complaint; and 3) their perceptions of their videodisc case development experience. To review, three hypotheses guided the study:

> H1: Students using the guided orienting instruction will choose more effective strategies for case development than students using the unguided orienting instruction.
>
> H2: Students using the guided orienting instruction will specify more complete complaint criteria than students using the unguided orienting instruction.
>
> H3: Student perception of the videodisc environment (e.g., appeal, utility, comfort, control) will vary with respect to the mode of orienting instruction.

Briefly, the main findings of the hypothesis testing are presented here:

1) Student pairs assigned guided and unguided orienting instruction used a variety of effective strategies to develop the case. Unguided pairs, while not receiving the checklist, intuited the use of many of the suggestions from the checklist. However, guided pairs used a slightly higher number of checklist strategies than unguided pairs. Guided pairs began factual and investigation earlier, began legal investigation later, and handled unexpected visitors with more discretion than did unguided pairs. Unguided pairs made more efficient use of their assistants on the case. These behaviors were encouraged on the orienting instruction checklist.

2) Student pairs receiving guided instruction were twice as likely to produce a Superior complaint as those receiving unguided instruction. Unguided pairs producing Superior complaints used a slightly higher average number of checklist strategies than the guided pairs producing Superior complaints. However, unguided pairs producing Adequate complaints averaged the least number of checklist strategies of any group. Student pairs (both guided and unguided) producing Superior complaints conducted, on average, earlier investigative (factual) research and later legal research than did pairs producing Adequate complaints. Thus, for both the guided and unguided groups, the use of effective strategies may have translated into better performance on the legal complaint. In addition,

there exists a strong association between guided students' success on the complaint and their having no prior legal experience before coming to law school. Inexperienced guided pairs are three times as likely to produce a Superior complaint as inexperienced unguided pairs.

3) Students in guided and unguided modes were quite positive about their videodisc case development experience. Both groups rated the disc as easy and enjoyable to use, and easy to understand. Guided students were slightly more confident of their complaint performance than unguided students. However, guided students felt slightly less in control of the experience, and were slightly less comfortable with their level of control than unguided students. The largest difference in perception data occurred in students' assessment of their own learning, with guided students perceiving a higher level of learning when comparing the disc to other methods of case development. Unguided students rated the adequacy of the instructions slightly higher than did guided students. However, 70% of unguided students and 40% of guided students would have liked more instructions before beginning to develop the case.

It should be noted that no guided pairs were observed using the orienting instruction in true "checklist" fashion (i.e., checking back regularly to see what to do next, doing it, and checking it off). It was usually read over at the start of the case, mentioned only occasionally as pairs worked, and returned to if they became "stuck."

This section outlines two areas in more detail: the analysis process used to reach these conclusions, and further discussion of the results.

ANALYSIS PROCESS

This study used performance and perception measures to examine students' use of the disc, their performance on a post-use test (i.e., the complaint), and their perceptions of the videodisc experience. The analysis of data from each measure is described below.

Performance Measures

Pathway Data. The following steps were used to analyze the guided and unguided student pathways through the case. First, a matrix was created listing the sequential case development

strategies of each pair. This matrix included the items listed in the orienting checklist. For each mode of use (guided and unguided), these strategies were tallied and a mean number of checklist choices was determined. Actual checklist choices could range from 0 to 9. A pair's checklist choice total was obtained by summing their actual choices that were also listed on the checklist. In this study, checklist choice totals ranged from 4 to 9. (This table is illustrated in a subsequent discussion of hypothesis testing.)

Observation Data. Conversation between partners was examined using a method described by Daiute (1989). Because collaboration allows both musing aloud individually and deliberating with a partner, each speaker's "uninterrupted contribution to the conversation" was counted as one "talk turn" (p. 7). Using this system, transcripts of conversation were coded and counted, arriving at a number of talk turns for each pair. Conversation levels were then labelled "high," medium," or "low." An effort was made to further discriminate between "creative" and "critical" types of conversation (Perkins, 1984) and between musing and deliberating conversational behavior (viz, Daiute, 1989). Each of these methods, although potentially valuable to consider, was difficult to apply. There were two reasons for this. First, conversation generated by the program would often fall into both the creative and critical conversation categories, or into both the musing and deliberating categories. Second, verbal interaction in this study occurred not only between partners but among the human pair and the characters on the screen.[3] As such, three general levels of conversation (High, Medium, and Low) were analyzed for purposes of this study. Conversation levels were rated numerically (High = 3, Medium = 2, and Low = 1) to arrive at conversation scores for each pair. Mean conversation scores were then calculated for each group.

Performance Data. Twenty complaints were prepared -- 10 by guided pairs, 10 by unguided pairs. For analysis purposes, three legal experts rated each of the twenty complaints blindly (i.e., without knowledge of the mode of orienting instruction relating to each complaint). Initially, each expert was asked to devise a three-part system. First, they developed their own criteria for what

[3] While the potential for research in this area is very interesting, it will not be fully-developed in this report.

constitutes an "effective" or high-quality complaint. Next, they each applied these criteria to judge the quality of each complaint. Finally, they each classified the 20 complaints according to their quality.

Not surprisingly, the criterion devised for an "effective" complaint were quite similar among the legal experts. However, the application of the criteria resulted in considerable variation among the experts. For example, each expert listed (as criteria for assessing the quality of the complaints) students' ability to thoroughly describe problems of proof, such as listing probable cause, adverse witnesses, and the possible immunity of the arresting officer. Perhaps understandably, the application of such subjective criteria led to considerable variation in the level of importance each expert assigned this area. This resulted in three diverse systems for classifying complaint quality: one was a numerical ranking, two were categorizations. Expert 1 ranked complaints in numerical order, from highest to lowest. Expert 2 developed 3 categories (i.e., Adequate, Fair, and Poor) and distributed the 20 complaints across all categories. Expert 3 developed 5 distinct categories (i.e., Excellent, Very Good, Good, Fair, and Poor) and placed complaints only in the top three.

This initial rating and classifying of complaints was interesting and perhaps indicative of the way we as teachers examine and judge student work. However, because the experts each devised a unique method of classifying the quality of student complaints, there was great diversity in the categories into which complaints were placed. This did not allow a common way to examine the strength of relationships between variables in this study. Thus, I initiated a second round of study of the complaints, this time asking each expert to place the 20 complaints in 2 equal groups: the upper 50% and the lower 50%. In most cases, this second rating required reconsidering complaints near "the middle of the pack," and reassigning those complaints to either the upper or lower group. This reconsideration of the complaints resulted in three independent ratings of the complaints into two categories.

The purpose of examining the strength of the relationship between modes of orienting instruction and complaint performance was to learn more about constructing efficient orienting instruction for introducing this videodisc to law students. For this reason, the next step was to devise a way to combine the complaint ratings on one matrix in order that performance could be discussed.

To do this, I combined the three expert ratings on one 2x2 contingency table. Using this method, every complaint was rated similarly by at least two of the three experts; many were rated similarly by all three experts. To distinguish between higher and lower complaint quality, the labels "Superior" and "Adequate" are used in this report.

To summarize, this rating system resulted in the categorizing of 20 complaints prepared by student pairs -- 10 from the guided orienting instruction mode and 10 from the unguided orienting instruction mode. These complaint ratings are used in the subsequent examination of Hypotheses 1 and 2. Hypothesis 3 measures the use, comprehensibility, and appeal of the *Litigation Strategies* program by the entire sample of 40 individuals.

Questionnaire and Interview Data. There were a total of 10 items on the questionnaire. Responses were collected using a 5-point Likert scale. Two checklist questions and two short answer questions collected data about students' prior experience, how they made decisions in the case, and their feeling about developing the case with a partner. For each question, a mean and standard deviation was calculated. For purposes of analysis, the alpha was set at the .05 level (one-tailed) for hypothesis testing. These data sets were examined using statistical tests since questionnaire data were numerical and included responses from 40 subjects. The balance of data analysis in this study involved non-statistical examination of qualitative data generated by the 10 guided and 10 unguided student pairs.

Qualitative data were collected using the structured pair interview. Perceptions of guided and unguided pairs were categorized according to several topics: new learning; least appealing aspects of the videodisc experience; most appealing aspects of the videodisc experience; suggestions for improving the disc; adequacy of instructions; and recommendations regarding adding the *Litigation Strategies* experience to the first year law school curriculum. The next part of this section reports results for each of the three hypotheses guiding the study.

HYPOTHESIS TESTING

HYPOTHESIS 1: Effect of Orienting Instructions on Use of the Videodisc

Hypothesis 1 predicts that guided pairs will choose more effective case development strategies than unguided pairs. Two areas will be reported in this analysis: 1) pathways through the case, and 2) conversation topics that emerged as guided and unguided student pairs prepared the case.

1. Pathways

Use of the checklist was expected to lead to the efficient preparation of an effective complaint. Twenty pathways were examined: 10 from guided pairs, 10 from unguided pairs. Table 2 presents the strategies used by each group within guided and unguided modes,[4] as compared with the checklist suggestions. As indicated in the table, student pairs used diverse strategies in various sequences (i.e., "1" = the first strategy used, "2" = the second strategy, and so on). The category "Total Choices" indicates the number of checklist choices each pair used, with a possible total of 9. Guided pairs in the study used a slightly higher average number of checklist strategies (6.7 per pair) than unguided pairs (5.8 per pair). Thus, there was only a slight difference between the guided and unguided pairs on strategy choices, despite the availability of the checklist by guided pairs.

TABLE 2 ABOUT HERE:

CHECKLIST CHOICES

Also indicated in Table 2 are two additional categories: Efficiency and Discretion. Under the category "Efficiency" are plus and minus symbols. Because the checklist included suggestions regarding efficient work habits, this category is reported here. A "(+)" efficiency rating indicates that the pair used their Investigative Assistant (IA) and Legal Assistant (LA) efficiently. That is, they

---

[4] It should be noted that although unguided pairs were not provided the orienting checklist, the list of checklist strategies were used in this analysis as a basis for determining whether the use of the checklist correlates with the creation of a superior legal complaint by student pairs.

devised tasks for the assistant, and then worked on another aspect of the case, versus merely waiting for the assistant to complete a task. A "(-)" rating in this category indicates inefficient use of an assistant. Of the 32 uses of assistants by guided pairs in this study, 69% were efficient. Of 29 uses of assistants by unguided pairs, 80% were efficient. This outcome leads to the question: What in the checklist might lead guided pairs to work less efficiently than unguided pairs? Is it efficient to work on another part of the program while an assistant completes an assigned task? These questions will be examined in the discussion of results.

The checklist provided guided pairs also suggested using discretion with unexpected visitors. The final category on Table 2, "Discretion," reports ratings of 62% for guided student pairs, and 45% for unguided student pairs. Positive or negative feedback within the program was provided to students following interactions with these visitors, according to the way they handled the interaction. Positive (+) discretion ratings were awarded student pairs receiving positive feedback following at least 75% of these interactions.

Despite the finding that overall the mean number of checklist choices differed only slightly between groups, there were interesting variations in individual strategies between groups. For example, guided pairs were aware of the existence of specific information about the case (i.e., a map of the area in and around Land's End Road, where the incident occurred, and a series of character statements describing potential witnesses). Few unguided students explored this information. In addition, there are differences between guided and unguided pairs in the mean time at which they initiated both investigative and legal research. These results will be discussed relative to Hypothesis 2.

A second area in which guided and unguided pairs varied involved their level of conversation and topics discussed as they developed the legal case.

2. Conversation

It was expected that conversation between partners might influence their general case development strategies and complaint performance. While it is difficult to point to specific outcomes of conversation between partners, Tables 3 and 4 illustrate some trends that emerged.

Table 3 illustrates complaint ratings, general conversation levels (High, Medium, and Low) based on talk turns, and major topics of conversation. Guided pairs rarely discussed the checklist. In fact, only 1 pair actually mentioned it by name after reading it initially, and only a few pairs referred back to it as they worked. However, between steps taken by guided pairs, there was frequent discussion of checklist options (although not referred to as such), indicating that many guided pairs had mentally stored the suggestions.[5]

TABLE 3 ABOUT HERE:

COMPLAINT RATING, LEVEL AND TOPICS OF CONVERSATION

Major topics of conversation included issues ranging from the client's story to the checklist. As indicated in Table 3, greatest variation between guided and unguided groups involved: other witnesses, reaction to the program, connectedness of the videodisc program to what students do in class, and actual procedures for using the program. Guided pairs more often discussed other witnesses, their reaction to the program, and the classroom connection; unguided pairs focused more on procedures for using the program.

Table 4 reports a mean conversation conversation score for guided and unguided groups. Conversation scores were determined using a point system, where High = 3, Medium = 2, and Low = 1. Overall, the mean conversation score of the group of 10 guided pairs was slightly higher (2.1) than that of the group of 10 unguided pairs (1.7).

---

[5] Although this study did not focus directly on the ability of learners to develop and retain mental frameworks for working in this environment, this is an area in which future research would be informative.

TABLE 4 ABOUT HERE:

MEAN CONVERSATION SCORES

Several trends emerged in conversation between partners, involving: interaction; use of assistants; considering alternatives; limiting premature decisions about the case; and pooling individual knowledge. Each area is addressed below, in a selection of various conversations across both guided and unguided groups.

Interaction. As mentioned earlier, conversation occurred not only between partners but between and among each partner and various characters on the screen. For example, consider this conversation between a student pair and the character onscreen after successfully completing the initial retainer arrangement with their client, Donald Boyd:

S1: Okay, so here he is in our office. Do we want his whole story now, or do we put him off?

S2: He's here, let's go for it. See what he has to say about what happened that day.

(They spend 15 minutes getting what they assume is Boyd's complete story.)

S2: Okay. We should check into his background before we let him go, don't you think?

S1: Yeah, but do it gently. We don't want to get him pissed off.

(They choose the 'Personal' section from the 'Background' menu.)

S2: Race? Ask him what race he is?

S1: What do you mean? He's Black!

S2: But I just want to see what he says.

S1: Well ...

(S2 chooses 'What is your race?' before they both agree to do this.)

Boyd: What do you mean, what race am I? Use your eyes -- get serious!

S1 (to S2, angrily): I'm not listening to you any more. This guy's getting mad. Give me the mouse!

S1 (to Boyd): Mr. Boyd, take it easy. I'm in control now. We're sorry.

Later, the same pair asks Boyd if he has anything else to say. They realize that Boyd neglected to share some critical parts of his story. The second student is still in control of the mouse.

S2: Okay Mr. Boyd, we're just about done with you. Anything else to add?

(Boyd tells them he has been arrested previously.)

S2 (to Boyd): Why you little ...

S1 (to S2): Easy, now, easy. (To Boyd on the screen): Mr. Boyd, we could help you the most if you would tell us the whole story please. Now what else happened?

S2 (to S1): Is this guy going to level with us or what?

S1: Look, this is probably just like how it happens in real life. You have to get them talking and talking and then they finally tell it all ... (laughter) ... and that's why it costs them so much to have a lawyer.

These examples illustrate interaction that occurred regularly between and among the students and the characters in the videodisc program.

Use of Assistants. As stated earlier, guided pairs were more discrete (62% positive rating) than unguided pairs (45% positive rating) when discussing the case with unexpected visitors. However, encounters with the town attorney and a newspaper reporter, even when pairs took questionable action, seemed to result in enjoyable learning. For instance, one pair agreed to see the reporter, and then realized that they were being asked to answer questions regarding the case to which they perhaps should not respond:

S1: Gee, this guy wants to know whether there will be criminal charges filed. What do we say?

S2: Well, our only choices are yes or no. There's no 'maybe.'

S1: So, I guess we'll have to say yes?

S2: Yeah, see what happens if we do.

(This results in a sternly-worded response from the senior partner, reminding them not to give interviews to reporters at this point.)

S1: Oh-oh, a note from the boss.

S2: He didn't like that. He didn't like that a lot.

S1: So we were over-eager. We'll remember not to invite him in next time.

Considering Alternatives. Working with a partner seemed to lead to regular examination of many possible strategies before actually taking action. These exchanges resulted in making decisions that were informed by two peoples' thinking. In the example below, a pair is discussing the motivation of Carol Weller in phoning in the 911 report.

S1: Well, Carol did phone in the report because she said she saw the junker car parked in front of the house, right?

S2: Yeah. I just wish there were some way we could get a look at the house.

S1: So let's see if our Investigative Assistant can help.

S2: Huh?

S1: This IA has evidence about the case. Maybe he has pictures of the house.

S2: I forgot about that. Let's check.

(They examine the house photos, and consider Weller's reasoning.)

S1: Look at that ladder-looking thing going up the wall of the house. What do you call that? A trellis. Yes, a trellis. Could that be ...?

S2: That's it! That's it! That's what she saw and she called in to report a ladder against the house! How are we going to deal with this?

S1: Well, we could go right to the police and tell them we have these photos.

S2: Or we could just stash the photos and get the legal memoranda we need for court.

S1: Or we could go have lunch, now that we've cracked the case (laughing).

Limiting Premature Decisions About the Case. Pairs often challenged each other's early theories about the case, increasing the range of options they discussed concerning people's roles in the case.

S1: Well, here's what I think. I think we can get them [police] on assault and battery, just by the way they threw him out of the car!

S2: Threw him out of the car? Let's go check that. I thought it sounded not quite that bad.

(In checking this, they realize only one officer was involved.)

S1: So he didn't get quite so roughed up as I thought. What other causes of action can you think of that we can back up?

S2: Let's read about possible causes in the memos, okay? Maybe something about his civil rights being violated.

Pooling Individual Knowledge. The phrase "two heads are better than one" was mentioned 8 times in response to an interview question about the value of working with a partner. Student pairs were overwhelmingly positive about working on the case with a partner. Two reasons frequently cited were the chance to pool their legal knowledge, and to make more informed decisions than they would individually. In one case, a pair was working with the wording of a legal memo.

S1: So what does it mean, to 'clearly establish' something?

S2: I've read about this in class. It means that under the law, it's the cop's job to know about other cases like the one he's involved in.

S1: Oh, like 'past precedent?'

S2: Exactly.

S1: We're so smart.

In summary, pathways for guided and unguided modes varied in several ways, including the mean number of checklist strategies chosen, the timing of the first use of the investigative assistant and the legal assistant, and pairs' use of discretion with unannounced visitors. While overall pathway variations exist between the guided and unguided groups in this study, the actual influence of the orienting instruction remains unclear.

HYPOTHESIS 2: Effects of Orienting Instruction on Complaint Performance

The second hypothesis examines the influence of orienting instruction on students' ability to specify three criteria on a legal complaint. The following tables present data showing the relationships between complaint performance and several other variables:

1. Mode of Orienting Instruction
2. Checklist Choices
3. Conversation Scores
4. Time of Investigative and Legal Research
5. Prior Legal Experience

1. Mode of Orienting Instruction

The construction of the legal complaint was described earlier. To analyze the way in which orienting instruction may influence complaint performance, the raw data was transformed as follows.

A matrix of all the complaints was produced, listing these data: plaintiff(s), defendant(s), cause(s) of action, and possible problems pairs expected when bringing the case to trial. The matrix was then given to three experienced attorneys who rated and classified each complaint according to criteria each devised independently.

Each legal expert developed, independently, rating criteria that was quite similar. Complaints should: name more than one plaintiff in the case; state specific causes of action (e.g., false imprisonment, unlawful arrest, assault and battery); support causes of action under a specific state or federal statute (e.g., the Massachusetts Civil Rights Act); and recognize problems that might surface in court. These include problems of proof (e.g., proving that race was a factor in the incident, proving that the officer's action was unreasonable); problems of immunity (e.g., city and state may be immune from punitive damages); and problems of reputation (e.g., prior police record of the client, officer's lengthy service on police force). Using these rating criteria, each expert placed complaints in top and bottom groups. The application of the rating criteria resulted in the complaint performance matrix in Table 5.

TABLE 5 ABOUT HERE:

COMPLAINT PERFORMANCE

Table 5 shows the association between complaint ratings for guided and unguided student pairs. Sixty percent of pairs receiving guided orienting instruction produced Superior complaints, versus 40% of pairs receiving unguided orienting instruction. The next part of this section considers an important variable relating to performance, checklist choices.

2. Checklist Choices

Pairs producing Superior complaints (guided and unguided) averaged 6.8 checklist choices. Pairs producing Adequate complaints (guided and unguided) averaged 6 checklist choices.

Table 6 shows the strength of the relationship between the number of checklist items chosen and the quality of the complaint filed by guided and unguided student pairs. Based on these data, guided pairs producing Superior complaints averaged 6.5 checklist choices; unguided pairs producing Superior complaints averaged 7 checklist choices, for a combined average of 6.8 checklist choices for the group of Superior complaints. Also, guided pairs producing Adequate complaints averaged 7 checklist choices; unguided pairs producing Adequate complaints averaged 5 checklist choices, for a combined average of 6 checklist choices for the group of Adequate complaints.

TABLE 6 ABOUT HERE:

MEAN NUMBER OF CHECKLIST CHOICES USED

3. Conversation Scores and Complaint Ratings

Table 7 shows the mean conversation scores associated with complaints prepared by guided and unguided groups. Interestingly, conversation scores for guided and unguided pairs with Superior complaints were identical to guided and unguided pairs with Adequate complaints. However, guided pairs had a slightly higher overall conversation score (2.1) than unguided pairs (1.7).

TABLE 7 ABOUT HERE:

MEAN CONVERSATION SCORES AND COMPLAINT PERFORMANCE

4. Time of Investigative and Legal Research

Table 8 illustrates the relationship between complaint performance and the time at which investigative and legal research was initiated. As referenced in Table 2, the "mean step" at which a checklist choice was used refers to when that step occurred in the total sequence of choices used by a student pair. In general, guided pairs with Superior complaints began conducting investigative research earlier (mean step of 2.8) than all other pair types: this includes unguided pairs with

Superior complaints (mean step of 3.3); unguided pairs with Adequate complaints (mean step of 3.3); and guided pairs with Adequate complaints (mean step of 4.8). In some cases, investigative research occurred even before the guided pairs established a relationship with their client.

TABLE 8 ABOUT HERE:

MEAN STEP OF INITIATION OF INVESTIGATIVE AND LEGAL RESEARCH

Table 8 also illustrates the mean step at which legal research was initiated by guided and unguided groups. Guided pairs producing Superior and Adequate complaints conducted later legal research (mean steps of 8.2 and 7.6, respectively) than unguided pairs producing Superior and Adequate complaints (mean steps of 5.8 and 4.2, respectively). These findings will be discussed later.

5. Prior Legal Experience

Of 20 teams of students in the study, 13 contained at least one individual having some legal experience before beginning law school. This ranged from doing a simple series of short investigative memos as a two-week clerk in a law office, to the completion of 3-4 months of fulltime clerking experience with a law firm. Thus, it is important to examine the possible relationship between prior legal experience and a team's success on the legal complaint after developing the videodisc case.

TABLE 9 ABOUT HERE:

PRIOR LEGAL EXPERIENCE

Table 9 displays the variance in complaint quality between pairs with and without prior legal experience. There appears to be no relationship between prior experience and either guided or unguided pairs' success on the complaint. However, there exists an association between guided

instruction and Superior complaint ratings for pairs with no prior instruction. That is, inexperienced guided pairs are three times more likely to produce a Superior complaint than inexperienced unguided pairs.

In summary, 3 legal experts developed a system for rating and classifying the legal complaints. Matrices were developed to examine possible relationships between complaint quality and mode of orienting instruction, checklist choices, conversation scores, time of initiation of investigative and legal research, and the prior legal experience of student pairs. The relationship between orienting instruction and quality of complaint is slight, although pairs with Superior complaints used slightly more checklist choices and were slightly more conversant than pairs with Adequate complaints. Superior complaints were associated with early investigative research and late legal research. Finally, there is an association between Superior complaint performance and guided student pairs with no prior legal experience. These relationships will be further discussed in a subsequent section of this paper.

HYPOTHESIS 3: Effects of Videodisc Experience on Student Perceptions

The third hypothesis suggests that student perceptions of their videodisc experience will vary with respect to their assigned mode of orienting instruction.

General Perceptions

To evaluate this hypothesis, I examined two types of student responses: oral and written. Oral discussion during the case was recorded and analyzed, as well as oral responses to a post-use structured interview with each student pair. Written data were collected with a 10-item 5-point Likert scale questionnaire and 4 open-ended response questions.

The questionnaire examined the influence of the videodisc case development experience on students' perceptions in several areas:

- ease of use of the technology;
- clarity of the presentation of the case;
- adequacy of instructions;
- confidence in the complaint criteria specified;

- level of control experienced while using the disc;
- level of comfort with perceived control;
- appeal of working with a partner to develop the case;
- enjoyment of the investigation experience;
- resemblance of the videodisc case to real life; and
- level of learning experienced in the process.

Among the advantages of using interactive videodisc for learning, Miller (1988) reports that interactive video offers a non-threatening, non-judgmental environment that is fun and challenging. Participants in this study -- those with guided and those with unguided orienting instruction -- responded favorably to questions about their enjoyment of the disc.

To analyze the questionnaire data, a mean response for each group was calculated for each question (see Table 10). Means and standard deviations were calculated for each question across both modes of orienting instruction. The deviation from the mean of each question was not significant. Although there were no statistically significant differences on any question, it should be noted that guided students are:

- slightly more confident in the criteria they stipulated in their complaints ;
- slightly less comfortable with the level of control they experienced while using the program (i.e. freedom to use the program in the way you chose, to work toward the goals of the complaint);
- slightly more positive in viewing the experience as one in which they learned about the process of investigating a legal case.

Unguided students report:

- slightly higher satisfaction with the written instructions (i.e., "case referral memo, instructions for using the program") they used to develop the case; and
- slightly higher enjoyment of the videodisc experience.

TABLE 10 ABOUT HERE:

MEANS AND STANDARD DEVIATIONS FOR QUESTIONNAIRE ITEMS

Student responses to the questionnaire and interview items also yielded information about their perceptions of the instruction they received. Table 11 displays the response of guided and unguided

individuals to the question: Describe your reaction to the instruction you received prior to starting the case -- would you have liked more, less, or was it the right amount?"

TABLE 11 ABOUT HERE:

ADEQUACY OF INSTRUCTIONS

This table illustrates the level of satisfaction of individuals in each mode of use. In the guided group, 40% (8 individuals) desired more pre-instruction, versus 70% (14 individuals) of the unguided group. In the guided group, 50% (10 individuals) were satisfied with the instruction they received, versus 30% (6 individuals) in the unguided group. Ten percent (2 individuals) of the guided group wanted less instruction. Anecdotal accounts from students are presented in 3 general categories: 1) new learning, 2) least favorite parts of the videodisc experience, and 3) favorite parts of the experience.

1. New Learning

All students were asked whether they experienced new learning as they used *Litigation Strategies*. Guided participants (8/20) responded to this question by comparing the *Litigation Strategies* process to the process used in their Legal Methods course. One group described the classroom procedure as "[having the case] handed to you on a platter." In contrast, *Litigation Strategies* was "like getting a lump of clay and having to shape the case, using both the law and the facts." Among their new realizations about litigation:

- The importance of talking to people on the fringe of the case as well as the obvious witnesses;
- It is difficult to interpret people's comments, judge their various perspectives about the case, and then choose good avenues to pursue.

Overall, *Litigation Strategies* was "a way to apply classroom thinking," and "a chance to work with the laws we have read about in class by first learning how to get the facts, next apply the facts to the law, and then get more facts."

Unguided students reported learning similar types of practical skills:

- Efficiency in the videodisc experience depended on first doing legal research, then interviewing, and then doing more legal research.
- Real life is "filled with deadends in interviews," "sometimes you need to shut people up," and "not all witnesses are going to be as helpful as the ones we had in class."
- It is important to "consider all contingencies when an attorney is under time and money constraints."
- A real case "consists of a breadth of sources of information like this to work with, like memos, articles, evidence, pleadings, and motions."

2. What Did You Like Least?

Guided pairs (5/10) cited frustration with the imposed time limit for case development, saying that the timeframe kept them from exploring all their options. Other areas of difficulty were reading legal memos onscreen, losing track of where they were in the program, and a desire for more information to "steer" them toward the facts of the case.

Unguided pairs (8/10) felt even more constrained by the time limit, citing "too much to do in too little time." These pairs wanted more time to "see all the possible things to do and then decide where to start," describing the videodisc as "such an expansive environment, it's a shame we couldn't take advantage of it all." One group, while lamenting the time constraint, said they "Felt rushed," then added, " but maybe this is what it's like in real life." Unguided pairs (7/10) mentioned the desirability of more instruction before getting started. One pair was quite frustrated by their interaction during unannounced visits from the town attorney and reporter. "The whole point of being a lawyer," they lamented, " is being able to twist other people's words, not them twisting our words!"

3. What Did You Like Most?

Guided pairs (7/10) mentioned the process of case development using interactive videodisc:

- The process provides a look at life in the real world, is very vocational, and is a great lead-in for summer employment. It is a good transition between class and the real world, providing a "chance to do it all."
- There is "great benefit in having to make decisions based on missing information."
- They felt they "got more involved in the case than they do in classroom cases" where "you get a packet of information handed to you."

- In Legal Methods, "brief-writing happens based on facts that are given to us. This makes you work."

- It is a good way to "check your knowledge as you go through the different phases of the case," because "they all need to come together when you file the complaint."

- The "uncovering process is good, and we liked maneuvering around between the parts of the story while building the case."

Two guided pairs mentioned the checklist:

- I "might not have thought of doing all of it if it had not been written down."
- [The checklist] ... "reminded me of what to do, and the instructions were good."

Unguided pairs (9/10) mentioned design features they liked:

- The program was described as "colorful," "wondrous," "very user-friendly," and "the phone icon was cool."

- The program "was easy to use, especially with the mouse, because the keyboard intimidates me."

- It was twice compared to a videogame in terms of being highly motivating and "having lots of things going on at once."

The reality of the simulation was mentioned often:

- It was "good to force us to sit at a desk and think about what to do, to bring it all together by making complex decisions. It was especially good to mesh what we've learned in class with what life will be like when we practice this stuff."

- The videodisc "is more realistic than our written work in class" and it "provides experience with the whole surround of a legal case that has a very close resemblance to real life."

- The personalities of the witnesses "definitely came out as we questioned them," and "it helped us to see how a young attorney could get fired."

- It was "hard to decide, by ourselves, when we've done enough," and at times was "so much like real life that we didn't know when to stop talking with witnesses."

This group also mentioned how the process affected them:

- In Legal Methods, "we are given facts and we're learning how to be a lawyer. Here we do it all. This is much more challenging."

- It "gave us an ego boost to get to act like a lawyer."

This evidence suggests further that both the guided and unguided groups were capable of navigating comfortably -- and in many cases thriving -- in a cognitively-demanding technology

environment. Both groups demonstrated the ability to choose appropriate action plans, organize their activity in order to develop a cohesive legal case.

SUMMARY

These results provide evidence that:

1) There was variation in the pathways through *Litigation Strategies* of first-year law students using two versions of orienting instruction. Guided pairs used a slightly higher number of checklist suggestions, began factual investigation earlier, and handled unexpected visitors with greater discretion than unguided pairs. Guided student pairs producing Superior legal complaints exhibited a higher level of conversation than did unguided student pairs. Unguided pairs made more efficient use of their Investigative and Legal Assistants.

2) There is a slight association between guided orienting instruction and Superior complaint performance. There is a stronger relationship between guided students' success on the complaint and the absence of prior legal experience for this group. Student pairs producing Superior complaints conducted earlier investigative and later legal research than pairs producing Adequate complaints.

3) Guided students perceived a higher level of learning than did unguided pairs when comparing the videodisc case development experience with traditional methods of working with the facts and theory of a case. These students felt slightly less in control of their experience, and were slightly less comfortable with this level of control than were unguided pairs. Finally, guided pairs were slightly more confident about their complaint performance.

4) Perhaps most important, there were large differences in student attitudes about the level of instruction written they received prior to developing the case. While expressing slightly more satisfaction with the instructions they received, 70% of the unguided students (and 40% of the guided students) desired more instructions before starting the case. It is significant that two guided students indicated their desire for less orienting instruction.

The following section of this paper examines the interrelationships among these findings, as well as the implications and significance of the study relative to the broader fields of formative evaluation and the development of technology materials for learning.

DISCUSSION, LIMITATIONS, AND IMPLICATIONS

This study was designed to learn more about law students' use of a complex videodisc environment. A specific variable, orienting instruction, was predicted to influence students' pathways, performance, and perceptions of the *Litigation Strategies* experience. Evidence from this study is used to document the importance of understanding learners' personal characteristics as well as their strategies for using open-ended discovery-based learning environments. This study promotes the value of formative evaluation not only to improve the instructional design and use of such environments but also to inform the development of support material designed to accompany these environments.

It is somewhat paradoxical to impose a mode of use within an environment based on exploration and discovery. There exists a tension between creating a useful orienting framework for students while preserving students' sense of discovery within the environment. However, the results of this study suggest value in providing pre-instruction to familiarize students with the organization of a complex computer-based environment.

This section of the paper outlines the central findings of the study as they relate to prior research, and examines the significance of this research for studies in designing computer-based simulations; designing formative evaluation to improve computer-based products; using technology in legal education; and using orienting instruction for learning. Additionally, this chapter presents limitations and implications of this study for implementing cognitively-demanding videodisc environments with learners of varied ability, motivation, and prior experience.

DISCUSSION OF CENTRAL HYPOTHESES

1. Does Orienting Instruction Influence the Use of an Open-Ended Computer-Based Environment?

This hypothesis predicts differences in the way guided and unguided pairs of students use the *Litigation Strategies* program.

The features of interactive videodisc technology increase the diversity of pathways students can take through a learning experience. As reported earlier (Hannafin, et al., 1986) this increases the difficulty of isolating and examining individual variables. Although variables beyond orienting instruction were not isolated in this study, it is important to examine their possible influence on student strategies. Four factors (in addition to orienting instruction) may have influenced student pathways in this study: prior knowledge, high ability, high motivation, and working with a partner. Each will be discussed.

This study found only slight differences between the case development pathways of students receiving two versions of orienting instruction. There exists evidence of the guided pairs' ability to use the orienting checklist to create a framework that helped them work through the case, supporting prior research (cf., Doyle & Carter, 1987). However, unguided pairs were also quite capable of "intuiting" many of the strategies from the checklist without benefit of seeing it before beginning the case. In previous studies, students' prior knowledge has been found to affect the need for orienting instruction (Clark, 1985; Clark & Voogel, 1985). In this study, both guided and unguided pairs had prior knowledge of the theory related to the litigation process. It is possible that this theoretical understanding prepared students for making thoughtful decisions about the practice of litigation. This effect corroborates previous findings from studies of advance instruction where the content is somewhat familiar to learners (cited in Melton, 1978).

This study also confirms the work of Levine and Loerinc (1985) citing less need for pre-instruction for highly motivated learners. Given the enthusiasm with which students in both modes approached this videodisc experience, the motivation of the unguided pairs may have provided benefits similar to the expected orienting instruction benefits for guided pairs.

The results of this study support the findings of Doyle (1983), which suggest that direct orienting instruction is most beneficial for high ability students, forcing them to actively create their own understanding of new material. Questionnaire and interview data indicate that many guided pairs used the orienting instruction to develop a personal framework of the case, to which they referred as they worked.

The influence of working with a partner, while not examined directly in this study, is also important to consider. The advantages of developing the case with a partner may be similar to those expected from developing the case with orienting instruction. Conversation between partners certainly influenced many decisions -- and consequent pathways -- of both the guided and unguided groups. It was clearly demonstrated by several pairs that when a particular topic is familiar to one partner and unfamiliar to the other, the more knowledgeable individual plays a role similar to orienting instruction. This could explain why students in both modes were able to work quite independently (i.e., as a team, without outside assistance) through the case.

One additional factor, the element of time, may have influenced the diversity of pairs' strategies in this study. As in a similar study of the influence of technology on performance (Gagnon, 1986), it may be that the exposure time in this study (90 minutes) was not enough time to reveal differences in users' pathways. Or, it may be that a shorter time limit would exaggerate differences between groups, since more than half of the checklist strategies were followed during the 90-minute time period in this study. The influence of a specified period of time may have limited participants' use of more diverse strategies that could have been further delineated. In future research, it would be useful to study pathways of learners with both longer and nonexisting time limits.

Collectively, these findings support the theory that numerous factors influence the pathways of students using an interactive videodisc environment such as *Litigation Strategies*. The next part of this section discusses complaint performance.

2. Does An Imposed Mode of Use Affect Complaint Performance?

This hypothesis suggests that orienting instruction leads to improved understanding for novices using a complex learning environment (Mayer, 1979), and improved performance on a post-use task (Hannafin, et al., 1986).

As stated earlier, there was an association between guided orienting instruction and complaint performance. Participants in this study reported the usefulness of the pre-instruction in developing the case and most suggested providing even more instruction. However, the orienting instruction was

not found to be directly related to improved performance on the post-use task of developing the legal complaint. This pattern may be related to the work of Gagnon (1986), who found that (verbally) providing videogame players with game rules before playing had no effect on their game performance. In simulated experiences, especially those that students find enjoyable, the effects of "rules" or "instructions" are difficult to isolate from other variables (as mentioned earlier in this report).

This study produced an equal number of Superior complaints from guided and unguided student pairs with prior legal experience. However, inexperienced guided pairs produced more high quality complaints than inexperienced unguided pairs. I attribute this finding to two possible causes. First, pairs with no prior real-life experience in case development may be more open to the legal conventions imposed by the design of the program. Second, the guided instruction may have been more useful to inexperienced than experienced pairs. It was expected that students recruited for this study would perform as novices in the *Litigation Strategies* environment due to their limited law school experience. However, the strategies used by both guided and unguided student pairs indicated higher-level functioning in the litigation process than was expected. In future studies, it will be useful to determine students' prior experience and to match groups to control for previous experience.

The effectiveness of orienting instruction may require greater interaction (between the learner and the orienting instruction) in order to have a more positive effect on performance. As reported earlier, participants in this study generally read through the checklist and then began the case, returning only to re-read the checklist when they became unsure of what to do next. There are at least three possible explanations for this: 1) student pairs who quickly browsed the checklist may have ignored most or all of the suggestions and worked on their own assumptions, 2) they may have read and mentally stored items they assumed would be useful, or 3) they may have become so engrossed in the case development experience that they actually forgot to refer back to the list. Data from this study provide evidence of each type of use of the checklist by guided student pairs.

The development and application of criteria for judging academic performance is difficult, especially in subjective areas with no "right" or "wrong" answers. In this study, the assessment of

complaints by legal experts was subject to each expert's philosophy of the elements constituting an effective legal complaint. While the criteria developed by these legal experts was quite similar, the application of those criteria varied as complaints were rated. While this is to be expected, it presents a problem when performance effects of a particular treatment (i.e., orienting instruction) are studied.

In addition, it is important to consider other measures of performance within discovery-based environments such as *Litigation Strategies*. These measures involve issues and factors beyond the quality of the complaint. Did students enjoy their experience? Did they learn new things? These, and other questions are equally important to understand when considering the value of practical, discovery-based learning environments. The third part of this section discusses student perceptions of their own experience with *Litigation Strategies*.

3. Do Individuals' Perceptions of Their Videodisc Use and Performance Vary Across Mode of Use?

This hypothesis suggests that students may have varying beliefs about their case development experience, depending on an imposed mode of use (Mayer, 1979; Mandinach, 1987).

Overall, students in both groups enjoyed the experience and were extremely motivated as they worked through the case. This may confirm the work of Hannafin, et al. (1985), describing the use of orienting instruction to help learners focus on working in complex interactive videodisc environments. Although there is no statistical data describing the motivation and focus of the participants in this study, both guided and unguided groups, each receiving a form of orienting instruction, appeared extremely focused as they worked on the videodisc case.

This study found that students' use of guided orienting instruction is related to slightly higher levels of confidence in their work, a slightly lower sense of personal control of their learning experience, and a slightly higher estimation of the learning value of the activity. Conversely, students use of the unguided orienting instruction related to a slightly higher level of enjoyment in the use of the videodisc, and a slightly higher impression of the disc as lifelike.

This study corroborates the work of technology researchers (Kurland & Pea, 1985, Newman, 1987) studying possible positive and negative effects of providing structure in discovery-based

environments. There is evidence in this study that the motivation of unguided pairs, inexperienced pairs may have served some of the same functions as orienting instruction, and that some guided students desired less instruction than they received.

It was suggested earlier that orienting instruction might assist participants in this study who felt anxious about developing the legal case using technology. All participants in this study had prior experience with computers; all but one had used a mouse as an input device. Thus, this initial concern appeared unnecessary.

This study adds to the discussion about what constitutes an effective organizer for learning unfamiliar material (Crokill, et al., 1988). Early studies supported abstract organizers (Ausubel, 1978). Recent studies have found greater effects with concrete organizers (cited in Mandinach, 1987). This study supports the use of both abstract and concrete orienting components. Guided and unguided pairs producing Superior complaints used more checklist suggestions than those with Adequate complaints. This success involved three fairly abstract suggestions (i.e., efficient use of assistants, avoid premature decisions, and use discretion with visitors), as well as the use of more specific checklist strategies.

It is tempting to consider that this videodisc program may have operated easily without any form of pre-instruction for these students. Hannafin and Hughes (1986), after studying the use of orienting instruction in well-designed videodisc environments, conclude that it is less necessary to provide orienting instruction in high quality instructional programs. Based on the reaction to this program of both students and practicing attorneys, there is the likelihood that the environment is quite instructionally-sound. However, based on a comparison of data from the pilot study and the study presented here, I believe that this reaction is at least in part due to the development of a clear, concise printed case referral memo and the printed instructions describing the use of the technology. Thus, the earlier pilot study proved informative to this implementation formative evaluation of *Litigation Strategies*.

LIMITATIONS AND IMPLICATIONS

The goal of this research was to further our knowledge about the use of discovery-based videodisc experiences in education. The study was designed to explore the relationship between the pathways, performance, and perceptions of guided and non-guided pairs of students within a specific, complex interactive videodisc environment.

Several limitations exist in this study. First, the results apply only to a small population of law students with beginning skills in legal education; results are not generalizable to more advanced students of law or to students of similar ability attending other law schools. Second, the results are limited to the performance of students who were asked to perform specific tasks during a predetermined period of time. The performance task measured only students' ability to specify certain complaint criteria, versus measuring other abilities that might be influenced by the environment or the orienting instruction (e.g., learning how to navigate within the program and explore a diversity of choices). Third, the results are limited by examining the performance of student pairs. Interaction between students is described but is necessarily excluded as a variable to limit the scope of the study. Fourth, all of the data collection and most of the data analysis was conducted by one person; experts examining the legal complaints provided the only inter-rater data analysis in the study. It is possible that another evaluator may have focused on other variables (e.g., interaction between students and the characters onscreen) or varied in the approach used to examine and score certain aspects (e.g., conversation topics and scores) of students' use of this videodisc.

With these limitations in mind, this study is informative to both legal education and the instructional design and development of open-ended computer-based products. Understanding the potential of guided instruction within such complex learning environments provides a framework for improving the design and implementation of these products for both students and teachers.

The results of the study were mixed. One can hypothesize several things from these results, including the fact that the orienting instruction did not provide a large amount of meaningful information to students about the process of case development. It would seem reasonable to posit that

the orienting instruction failed to have a measurable impact on performance because it was not correlated more specifically with portions of the written legal complaint. It would also seem reasonable to suggest that the novelty of the technology prevented students from pursuing the case as rigorously as they might in real life or even in a classroom setting. For example, student pairs in both guided and unguided groups spent more time on investigative than legal research. Interview comments supported this finding. It was interesting and fun to use the videodisc program to interview various witnesses, examine actual evidence from the case, and discuss relationships between factual information. Students were less enthusiastic using the program to read through and decipher various legal memoranda in textual form on the screen; in a real law office, this task comprises a large part of an attorney's job.

The fact that there were such positive results in one area (i.e., student perceptions), and mixed results in two others (i.e., pathways and performance) led us to conclude that there are advantages as well as disadvantages in using orienting instruction in discovery-based environments. Based on the results of this study, the question is not whether orienting instruction is effective. Rather, it is important to learn more about the characteristics of effective orienting instruction, and with what types of learners orienting instruction should be used. For example, inexperienced students in this study benefited more from orienting instruction than experienced students. Subsequent research could examine the use of orienting instruction of varying the breadth and depth of orienting instruction with students of varying prior experience.

This analysis of law students' use of an open-ended videodisc environment suggests the continued exploration of several important issues related to technology and learning. An important factor in deciding whether and how to use orienting instruction is the purpose for having students use the product. If the instructional goal is to produce a rigorously investigated and analyzed product (i.e. the complaint), orienting instruction can provide an overview of the available "routes" and students can choose a direction. If the goal is to experience the realistic process of case development (e.g., experiencing surprise visits from aggressive people, going down deadends, making mistakes), a minimum of orienting instruction may be more apt.

Perhaps an even more practical issue in deciding how to use orienting instruction involves the general availability of the videodisc equipment, as well as the amount of time allotted to the exercise by the instructor. If the equipment and attitude of an instructor permit unlimited time to "discover" the relationship between the facts and the theory of the case, less structure might be imposed at the outset. However, if students need to get quickly into -- and out of -- the exercise, an orienting framework could provide a structure within which to work more expediently.

The design of *Litigation Strategies* represents a departure from the traditional use of computer-based environments for learning. Its use within the law school environment, while broadening the scope of the traditional legal educational curriculum, may be enhanced by the availability of varying types of orienting instruction for learners of varying background. This broadened view of using technology represents the hope that technology may allow teachers to help learners at many levels to achieve new types of goals in school curriculums -- goals that were previously reserved for real life and professional experience on the job.

REFERENCES

American Video Institute, Rochester Institute of Technology. (in production). Litigation Strategies. [Interactive videodisc program]. Rochester, NY: Lawyer's Cooperative Press.

Ausubel, D. (1978). In defense of advance organizers: A reply to the critics. Review of Educational Research, 48(2), 251-257.

Becker, H. (1987). The impact of computer use on children's learning: What research has shown and what it has not. (Report No. 18). Baltimore, MD: John's Hopkins University.

Bok, D. (1985, May/June). Looking into education's high-tech future. Harvard Magazine, 29-38.

Clark, R. (1985). Evidence for confounding in computer-based studies: Analyzing the meta-analyses. Educational Communication and Technology Journal, 33(4), 249-262.

Clark, R., & Voogel, A. (1985). Transfer of training principles for instructional design. Educational Communications and Technology Journal, 33(7), 113-124.

Crokill, A. Bruning, R., & Glover, J. (1988). Advance organizers: Concrete versus abstract. Journal of Educational Research, 82(2), 76-81.

Daiute, C. (1989). Play as thought: Thinking strategies of young writers. Harvard Educational Review, 59(1), 1-23.

Doyle, W. (1983). Academic work. Review of Educational Research, 53(2), 159-199.

Doyle, W., & Carter, K. (1987). Choosing the means of instruction. In V. Richardson-Koehler (Ed.), Educator's handbook: A research perspective. (pp. 188-206). New York: Longman.

Gagnon, D. (1986). Interactive versus observational media: The influence of user control and cognitive styles on spatial learning. Unpublished doctoral thesis, Harvard Graduate School of Education, Cambridge.

Hannafin, M., Garhart, C., Rieber, L., & Phillips, T. (1985). Keeping interactive video in perspective: Tentative guidelines and cautions in the design of interactive video. In E.Miller & M.L. Mosley (Eds.), Educational Media and Technology Yearbook. Littleton, CO: Libraries Unlimited.

Hannafin, M., & Hughes, C. (1986). A framework for incorporating orienting activities in computer-based interactive video. Instructional Science, 15, 239-255.

Hannafin, M., Phillips, T., & Tripp, S. (1986). The effects of orienting, processing, and practicing activities on learning from interactive video. Journal of Computer-Based Instruction, 13(4), 134-139.

Kurland, M., & Pea, R. (1985). Children's mental models of recursive Logo programs. Journal of Educational Computing Research, 1, 235-243.

Levine, L., & Loerinc, B. (1985). Investigating the scope of an advance organizer for compiler concepts. Journal of Technology Systems, 13(3), 175-183.

Mandinach, E. (1987). Clarifying the "A" in CAI for learners of different abilities. Journal of Educational Computing Research, 3(1), 113-127.

Mayer, R. (1979). Can advance organizers influence meaningful learning? Review of Educational Research, 49, 371-383.

Melton, R. (1978). Resolution of conflicting claims concerning the effects of behavioral objectives on student learning. Review of Educational Research, 48, 291-302.

Miller, E. (1988, August 29). Interactive video in CLE [Continuing Legal Education] for lawyers in Florida. National Law Journal, 17, 28.

Newman, D. (1987). Functional environments for microcomputers in education. In R. Pea & K. Sheingold (Eds.), Mirrors of minds: Patterns of excellence in educational computing (pp. 57-66), Norwood, NJ: Ablex Publishing Corporation.

Perkins, D. (1984). Creativity by design. Educational Leadership, 42, 18-25.

Roblyer, M. (1985). The greening of educational computing: A proposal for a more research-based approach to computers in education. Educational Technology, 25, 40-44.

Roblyer, M., Castine, W., & King, F. (1988). Assessing the impact of computer-based instruction. Computers in the Schools, 5(3-4).

Zollman, D., Noble, M., & Curtin, R. (1987). Modelling the motion of an athlete: An interactive video lesson for teaching physics. Journal of Educational Technology Systems, 15(3), 249-257.

TABLES

TABLE 1. RELATIONSHIP BETWEEN MEASURES AND HYPOTHESES

	MEASURES				
HYPOTHESIS	Tracking Program	Observation	Complaint	Questionnaire	Interview
H1: Pathway	X	X			
H2: Performance			X	X	X
H3: Perceptions		X		X	X

TABLE 2: CHECKLIST CHOICES

G	TOTAL CHOICES	CHECKLIST CHOICES (number refers to sequence of choice)									EFFICIENCY		DISCRETION	
		Memo	D Boyd	911	House	Map	Stats	L Boyd	Marshall	Denver	Use IA	Use LA	Atty	Reporter
1	9	1	2	4	6	5	7	10	8	9	3(+)	11(-)	+	+
2	6	1	3	4&6	-	5	-	-	8	9	2(+)	7(-)	+	na
3	7	1	2	7	8	9	-	-	6	4	3(+)	5,10(+)	+	+
4	8	1	2 (!!)	7	-	8	9	10	4	5	3,6(+)	11(-)	+	-
5	4	1	2	-	-	-	-	-	4	5	3(+)	6,7(-)	-	-
6	4	1	3	-	-	-	-	-	5	6&9	2,4,7(+)	8,10(+)	+	-
7	8	1	2&11	7	-	10	8	5	3	6	4,9(+)	6,12(-)	na	-
8	8	1	4 (!)	6	8	9	7	-	5	11	2(+)	3,10(+)	na	+
9	7	1	3	9	7	8	4	-	10	-	2,5(+)	6,11(+)	na	na
10	6	1	2&4	7	8	-	-	-	3	5	6,9(-)	9(-)	na	na
	Mean 6.7										69% (+)		62% (+)	

UG	TOTAL CHOICES	CHECKLIST CHOICES (number refers to sequence of choice)									EFFICIENCY		DISCRETION	
		Memo	D Boyd	911	House	Map	Stats	L Boyd	Marshall	Denver	Use IA	Use LA	Atty	Reporter
1	9	1	2	8	11	10	9	5	3	4	6(-)	7(-)	na	-
2	5	1	2	-	-	-	-	8	7	6	4(+)	3,5(+)	+	-
3	5	1	4	-	-	-	10	-	6	7&9	2,3,5(+)	8,11(+)	+	-
4	4	1	2	5	-	-	-	-	4	-	3(+)	6,7(-)	na	-
5	7	1	2&5	7	8	-	-	4	3	4	6(+)	9(-)	na	+
6	7	1	7	4	5	6	3&9	-	8	-	2(+)	10(-)	na	na
7	5	1	3 (!!)	8	-	-	-	-	5	7	2,6(+)	4,9(+)	na	-
8	4	1	3	-	-	-	-	-	5	4	6(+)	2(+)	na	-
9	7	1	4&12	6	11	-	-	10	5	7	3,8(+)	2,9(+)	+	+
10	5	1	2 (!)	-	-	-	-	6	5&6	3&7	5(+)	4(+)	na	na
	Mean 5.8										80% (+)		43% (+)	

Key

G = Guided

UG = Unguided

! = Fired

Efficiency

(+) = Ordered work, continued case in interim

(-) = Ordered work, waited

Discretion

+ = Received at least 75% positive feedback after meeting visitors

- = Received less than 75% positive feedback after meeting visitors

na = Not applicable (no visitors during videodisc use)

TABLE 3 COMPLAINT RATING, LEVEL AND TOPICS OF CONVERSATION

		LEVEL OF CONVERSATION			MAJOR TOPICS OF CONVERSATION												
G	RATING	High	Med	Low	Client Story	Other Wit	Causes Action	Case Theory	Case Facts	Case Costs	Mouse Use	Sr. Ptnr Reims	Use of IA/LA	React to Prog	Connect Classrm	Pro-cedures	Check-list
1	S	x			x	x	x		x					x			
2	S		x		x		x							x	x		
3	A		x		x	x			x	x							
4	S			x	x						x	x	x	x		x	
5	S			x	x	x	x	x						x			x
6	S	x				x	x	x							x		
7	S	x				x	x	x								x	
8	A			x	x			x	x						x		
9	A		x		x					x		x	x				
10	A			x		x			x		x			x	x		
					7	6	5	4	4	2	2	2	2	5	4	2	1

		LEVEL OF CONVERSATION			MAJOR TOPICS OF CONVERSATION												
UG	RATING	High	Med	Low	Client Story	Other Wit	Causes Action	Case Theory	Case Facts	Case Costs	Mouse Use	Sr. Ptnr Reims	Use of IA/LA	React to Prog	Connect Classrm	Pro-cedures	Check-list
1	S		x		x	x	x		x			x					
2	A			x			x		x				x			x	
3	A			x	x									x		x	
4	A			x		x	x	x			x						
5	S		x		x				x	x						x	
6	S			x	x	x	x	x								x	
7	A	x			x		x				x				x		
8	A		x			x	x	x								x	
9	A	x			x			x	x								
10	S	x			x			x	x				x			x	
					7	4	6	5	5	1	2	1	2	1	1	6	NA

Key

S = Superior Complaint A = Adequate Complaint NA = Not Applicable

TABLE 4: MEAN CONVERSATION SCORES

GUIDED	UNGUIDED
2.1	1.7

TABLE 5: COMPLAINT PERFORMANCE

	GUIDED	UNGUIDED
SUPERIOR	6	4
ADEQUATE	4	6
	(10)	(10)

TABLE 6: MEAN NUMBER OF CHECKLIST CHOICES USED

	GUIDED	UNGUIDED	COMBINED
SUPERIOR	6.5	7	(6.8)
ADEQUATE	7	5	(6)
	(6.8)	(6)	(6.4)

TABLE 7: MEAN CONVERSATION SCORES AND COMPLAINT PERFORMANCE

	GUIDED	UNGUIDED	COMBINED
SUPERIOR	2.1	1.5	(1.9)
ADEQUATE	2	1.8	(1.9)
	(2.1)	(1.7)	(1.9)

TABLE 8: MEAN STEP OF INITIATION OF INVESTIGATIVE AND LEGAL RESEARCH

	INVESTIGATIVE ASSISTANT		LEGAL ASSISTANT	
	GUIDED	UNGUIDED	GUIDED	UNGUIDED
SUPERIOR	2.8	3.3	8.2	5.8
ADEQUATE	4.8	3.3	7.6	4.2

TABLE 9: PRIOR LEGAL EXPERIENCE

		GUIDED	UNGUIDED	COMBINED
EXPERIENCED	SUPERIOR	3	3	6
	ADEQUATE	3	4	7

		GUIDED	UNGUIDED	COMBINED
INEXPERIENCED	SUPERIOR	3	1	4
	ADEQUATE	1	2	3

(10)	(10)	(20)

TABLE 10: MEANS AND STANDARD DEVIATIONS FOR QUESTIONNAIRE ITEMS

QUESTIONNAIRE ITEM	GUIDED (n=20)	UNGUIDED (n=20)
1. How easy or difficult was the technology to use? (1=easy ... 5=difficult)	1.60 (0.60)	1.70 (0.66)
2. How easy or difficult was it to understand the case? (1=easy ... 5=difficult)	1.95 (0.89)	1.75 (0.85)
3. How adequate or inadequate were the instructions? (1=adequate ... 5=inadequate)	2.50 (1.00)	2.20 (.83)
4. How confident are you of your complaint criteria? (1=no conf ... 5=complete conf)	3.15 (0.81)	2.80 (1.15)
5. How much control did you have over this experience? (1=no control ... 5=complete control)	3.40 (0.99)	3.65 (1.04)
6. How comfortable were you with this level of control? (1=very comf ... 5=very uncomf)	3.00 (1.26)	2.55 (1.32)
7. How much did you like working with a partner? (1=not at all ... 5=a lot)	4.25 (0.79)	4.10 (1.21)
8. How much did you enjoy using Litigation Strategies? (1=not at all ... 5=a lot)	4.00 (0.86)	4.30 (0.92)
9. How much did this experience resemble real life? (1=not at all ... 5=very much)	3.15 (1.14)	3.45 (1.10)
10. How much did you learn about investigating a case? (1=very little ... 5=a lot)	3.65 (0.87)	3.00 (0.92)

TABLE 11: ADEQUACY OF INSTRUCTIONS†

	GUIDED	UNGUIDED	COMBINED
MORE INSTRUCTIC	8 (40%)	14 (70%)	22 (55%)
NO CHANGE	10 (50%)	6 (30%)	16 (40%)
LESS INSTRUCTIOI	2 (10%)	--	2 (10%)
	(20)	(20)	(40)

† = based on opinions of entire sample (40 individuals)